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ABSTRACT

To test three hypotheses concerning fingerspelling's contribution to word recognition, 24 deaf children in three age groups (7-9, 10-12, and 13-15 years) were administered a vocabulary recognition test and a lexical decision task. Subjects' performance was measured by the number of words accurately identified and the response latency. Results did not support the hypotheses. Children recognized more vocabulary in print than in fingerspelling; were more accurate in deciding the lexical status of words presented in print than words presented in fingerspelling; and were more accurate in deciding the lexical status of words that are typically signed in sign language than words that are typically fingerspelled. Results suggested that deaf children organize their recognition of written words around sign language and do not organize their recognition of fingerspelled words around sign language. (CL)

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Deaf Children's Recognition of Written Words: Is Fingerspelling the Basis?

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Abstract

Normally hearing children use speech to mediate their recognition of written words. How do deaf children who use sign language mediate their recognition of written words? Recognition of written words may pose a special problem for deaf signing children because written words provide no clues to sign language. However, written words can be represented in fingerspelling. Fingerspelling-- where each letter is represented with one hand gesture-- is used by deaf people who sign to represent English words that are not readily translatable into sign language. Might deaf children who sign use fingerspelling to mediate their recognition of written words?

The Hypothesis predicts:

(1) Young deaf children will recognize more words in fingerspelling than in print.

(2) Older deaf children will recognize words equally well in the two modes after learning how print maps onto fingerspelling.

(3) All deaf children will be better able to recognize in print words that are typically fingerspelled in sign language than words that are typically signed in sign language.

To test the hypothesis:

(1) A vocabulary recognition test was given
  (a) once in print
  (b) once in fingerspelling

(2) A lexical decision task was given
  (a) once in print
  (b) once in fingerspelling

The results did not support the hypothesis:

(1) The children recognized more vocabulary in print than in fingerspelling.

(2) The children were more accurate in deciding the lexical status of words presented in print than words presented in fingerspelling.

(3) The children were more accurate in deciding the lexical status of words that are typically signed in sign language than words that are typically fingerspelled.

The results suggest instead that deaf children:

(1) Organize their recognition of written words around sign language.

(2) Do not organize their recognition of fingerspelled words around sign language.

Aims

1. To determine if deaf children who use sign language

   a. Use fingerspelling to mediate their recognition of printed English words.

   or

   b. Use their knowledge of signs to organize their recognition of either printed or fingerspelled English words.

2. To examine over time the organizational relationships among print and fingerspelling in deaf children's recognition of written words.

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Subjects and General Method

24 DEAF CHILDREN DIVIDED INTO THREE AGE GROUPS:

7- 9 years
10-12 years
13-15 years

8 subjects in each group
4 girls and 4 boys in each group

ALL THE DEAF CHILDREN SHARED THE FOLLOWING CHARACTERISTICS:

- Born severely or profoundly deaf
- Has normally hearing parents
- Has normal nonverbal intelligence
- Has no learnig problems other than deafness
- Began schooling at age 3 or younger
- Attends day school
- Lives at home with family
- Communicates through sign language and fingerspelling (may also use some speech)

EACH SUBJECT WAS TESTED INDIVIDUALLY:

Examiners were fluent in sign language and fingerspelling
Testing took place at school

TASK ADMINISTRATION:

Vocabulary task was Peabody Picture Vocabulary Test

- Administered once in print and once in fingerspelling
- Child sees word and then points to correct picture from 4 choices
- Testing began with first item for all children
- Testing stopped when child was incorrect on 6 out of 8 consecutive trials

Lexical decision tasks

- Given once in print and once in fingerspelling
- Children interacted with a computer
- Computer presented words, recorded accuracy and response times
- Printed words appeared on a computer screen
- Fingerspelled words appeared on a video tape (only the hand and no other body part was visible)

Task Presentation

- Order was counterbalanced across children in each group
- Print and fingerspelling versions of tasks given on different days

Tasks

1. Vocabulary Recognition

- Picture Vocabulary Test (PPVT)
- Administered once in print and once in fingerspelling

- Performance measured in number words correctly recognized

2. Lexical Decision

- Administered once in print and once in fingerspelling
- Two versions given on different days
- Stimuli were identical
- Presented order counterbalnced across children
- Child decides whether a given letter string is a real word or not

Target stimuli were English words of four types:

a. Half were readily translatable into sign language
-- signable-- typically signed in sigh language
b. Half had no sign language translations
--non-signable-- typically fingerspelled in sign language

For both signable and non-signable words:

c. Half were short in length (3 -5 letters)
d. Half were long in length (8-10 letters)

Foils were pronounceable and non-pronounceable non-English words

Performance measured with:

Number of words accurately identified
Response latency

Results

Vocabulary Recognition

Figure 1 shows the children's performance on the vocabulary recognition tasks when the words were presented in print and fingerspelling.

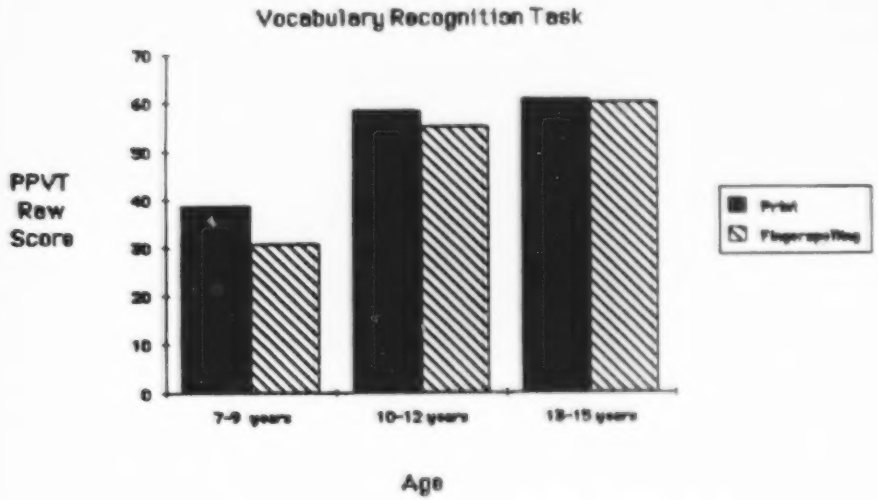

Figure 1

Mode, $p < .01$
Age, $p < .01$
Mode x Age, N.S.

(1) Overall, 7-9 year old children performed more poorly than 10-12 and 13-15 year old children. The performance of 10-12 and 13-15 year old children did not differ.

(2) At all age levels, children performed more poorly when the words were presented in fingerspelling than when they were presented in print. Although there was a tendency for the oldest subjects to be able to recognize words equally well in the two modes, the interaction was not significant.

Lexical Decision Accuracy

Figure 2 shows the children's accuracy on the lexical decision tasks when the words were presented in print and fingerspelling.

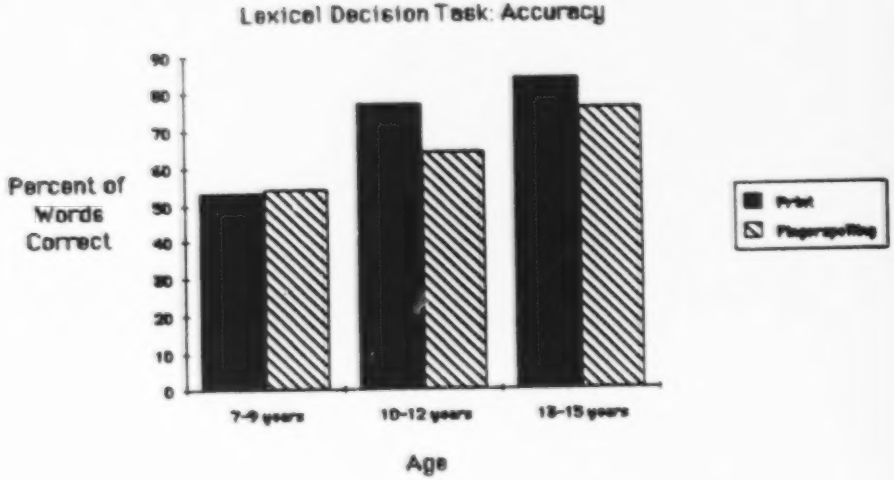

Figure 3

Mode, $p < .01$
Age, $p < .01$
Mode x Age, N.S.

(1) Overall, with age, the children become more accurate at deciding whether a string of letters is a real word or not.

(2) The children were less accurate when the words were presented in fingerspelling than when they were presented in print. There was a tendency for the 7-9 year old children to recognize words equally well in the two modes, but the interaction was not significant.

Lexical Decision Reaction Time

Figure 3 shows the children's mean reaction time on the lexical decision tasks given in print and fingerspelling.

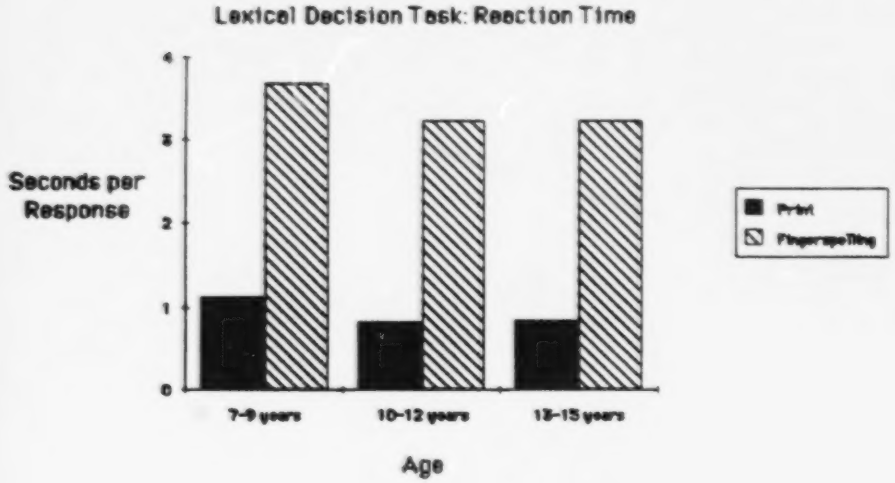

Figure 2

Mode, $p<.01$
Age, $p<.01$
Mode x Age, N.S.

(1) Overall, the children recognized real words faster in both print and fingerspelling as they grow older.

(2) The children are significantly slower at recognizing real words in fingerspelling than in print. No age group recognized real words in fingerspelling as quickly as in print.

Word Characteristics Affecting Lexical Decision

Table 1 summarizes the effects of signability and word length on the children's ability to decide wheter a letter string was a real word or not.

Table 1

Word Characteristics that Facilitate Word Recognition

	Decision Accuracy		Reaction Time	
	Print	Fingerspelling	Print	Fingerspelling
Signability				
Signable	79%	66%	0.885sec	3.352sec
Not signable	63%*	62% n.s.	0.992sec*	3.398sec n.s.
Word Length				
Short (3-5 letters)	84%	74%	0.878sec	2.753sec
Long (8-10 letters)	58%*	46%*	0.924sec*	3.997sec*

*$p<.01$

(1) Wheter a word was signable-- is typically signed in sign language-- facilitated the children's recognition of words in print, but not in fingerspelling. The children recognized more words and were faster when the word was typically signed.

(2) The children were more accurate and faster at recognizing real words when the words were short (3-5 letters) than when they were long (8-10 letters). Word length affected the children's performance in fingerspelling as well as in print.

(3) The effects of word length and signability were consistent across the age groups.

Conclusions

The data do not support the hypothesis that deaf children use fingerspelling to mediate their recognition of written words.

(1) Recognition vocabulary is greater for printed that for fingerspelled words.

(2) Lexical decisions are made faster and more accurately for printed words than for fingerspelled words.

(3) Printed words that are typically signed are recognized more accurately and quickly than words that are typically fingerspelled.

Instead the data suggest:

(1) Deaf children organize their recognition of written words around their knowledge of sign language (not fingerspelling).

(2) Deaf children organize their recognition of printed words and fingerspelled words differently.

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